

# CONTL NTS

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### Dear Customer:

The manufacturer of our p.c.b.'s has informed us that games employing flourescent light fixtures may cause enough line noise to inhibit the sound generator.

To alleviate this problem, it is necessary to install a line filter between the light fixture and the power source.

Tago Electronics



The Turn-A-Profit $^{TM}$  game change kit utilizes one of a number of games that are either copyrighted by Tago Electronics or are purchased under license from the original manufacturer.

By this affidavit, Tago certifies that the boards generating the games Conquest, Anteater, and Calipso have been purchased under license. Anteater and Calipso have furthermore been copyrighted which copyright has been assigned to Tago Electronics.

Tago Electronics holds the purchaser of the kit harmless on any action that challenges the license and/or copyright of the game.

As emphasized in the manual of instructions of the kit, Tago urges that, before installation of the kit commences, all original manufacturer names, logos, and art work be removed or painted over. This is the purchaser's responsibility entirely and it is Tago's good advice,

## F.C.C. USER INFORMATION

### WARNING:

THIS EQUIPMENT GENERATES, USES AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. AS TEMPORARILY PERMITTED BY REGULATION, IT HAS NOT BEEN TESTED FOR COMPLIANCE PURSUANT TO SUBPART J OF PART 15 OF F.C.C. RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

### COSMETIC CONVERSION INSTRUCTIONS

- 1. It is most important that all visible original manufactures' name, logo, and art work are removed prior to conversion and replaced by the graphics supplied by Tago.
- 2. The original serial number placque must remain on game for purposes of licensing with government as well as record keeping on UCC-1 filing where debt or leases are involved.
- Remove header, view plex, and side decals. Decals may easily be removed by use of a heat gun or razor scraper. Be certain that all criginal art work names and logos are removed.
- 4. Some games will require that you cover original painted surfaces. Please use black glass ename! water base paint using a roller (you may substitute other colors). In some cases the monitor card board bezel will need to be painted as well.
- 5. Install new header & view plex with original hardware.
- 6. Control panel wrap is designed for use with every game. Apply it carefully over old art work after removing buttons & stick. Be sure no bubbles are left under wrap. Apply instructions. Control panel plexy covers have been stocked separately by distributor; find the one marked by the name of the game and install. If hole cutting is required use 1 1/8 inch hole saw dril! bit using plexy as your guide.
- 7. Apply side decals horizontally on lower half of cabinet.
- 8. Stand back and admire your new game. This was the hard part. Refer to Electronic Conversion sheet.
  - "How to Play" instructions and donuts for buttons are to be installed on the control panel under the control plexy. The Tago logo may be placed under control plexy or on front face of cabinet on coin door.

### STERN CONVERSION INSTRUCTIONS

Conversion of this game is fairly easy. The entire harness (with the exception of the control panel) is compatible with the new game you are installing. To convert the control panel, remove control pane, disconnect harness at the white plug. Make necessary changes (drilling, wrap and plexy installation.)

Now, using the harness you removed from the control panel, cut about 6 inches from white plug. Butt splice this portion of the harness to the control harness provided with the kit.

Refer to pinout sheet for color code information to match existing wiring to the new game you are now installing.

Stern Game

WHT/ORG - Pin 7 / Pin H - WHT/BLU

New Game

IP UP YELLOW - Pin 7 / Pin H - BROWN IP DN

You would connect the Stern WHT/ORG to the New Game YELLOW You would connect the Stern WHT/BLU to the New Game BROWN

The New Game tells you what function that wire goes to, so connect it to appropriate button on Control panel.

NOTE: If there are jumpers on the existing card edge of your Stern Came, cut the jumper about 1/4 inch from where the jumper and harness wire meet at card edge. Tie wrap these jumpers to the harness so they won't short out anything.

## UNIVERSAL HARNESS CONVERSION INSTRUCTIONS

The TAGO Universal Harness can be installed into any video game that uses a color, vertical, raster scan monitor with a power supply that provides +12V, +5V & -5V. (If your game does not meet the P.S. requirements TAGO can provide an isolation transformer and switching power supply at a very reasonable cost.)

Most games are engineered to have 2 separate harnesses, 1) the game harness and 2) the AC distribution harness. Installation of the Universal Harness entails removal of the existing game harness only. (This must be done due to the functional differences between the existing game and the game you are converting to.)

- I. 1. To remove the game harness disconnect and <u>note polarity</u> on video monitor connector.
  - 2. Disconnect or cut wires to speaker about 6 inches from speaker.
  - 3. Next, disconnect harness from Control Panel.
  - 4. Now, disconnect harness from Coin Box (coin switch, lights and control panel and test switches, if there)

Now, the important stuff,

- 5. Ensure that +5, -5, +12 and ground connections at power supply are properly labeled for future connection
- 6. Remove the existing PC board and remove game harness from cabinet
- II. Universal Harness Installation
  - A. Monitor--WELLS GARDNER Connect 10 pin inline connector with red wire to TOP interface card (if connector is on mother PCB connect with RED toward you.
    - --ELECTROHOME see enclosed diagram of mother board for connections (reference sheets)
  - B. Control Panel--See Universal Harness sheet for wire color codes (reference sheets)
  - C. Coin Box--See Universal Harness sheet for wire color codes for lights (if present) coin switch(s) and coin counter (reference sheets)
  - D. Speaker--The two long gray wires with butt splices connect to the two wires on your speaker.
  - E. PC Board--Place PC board so as to take up any excess slack on the universal harness and position it on side wall ( to prevent dust buildup)

F. Next, connect the wires on your power supply +5 to white/red, -5 to white/green, +12 to violet, and ground to black. DO NOT CONNECT COIN COUNTER AT THIS TIME. After verifying that all connections are secure and proper turn game on and actuate coin switch. Listen for game sounds when pressing IP start button. If picture is upside-down, do the following:

WELLS GARDNER - See Wells Gardner reference sheet.

ELECTROHOME - See Electrohome reference sheet.

NOTE - Horizontal sync, horizontal and vertical size will probably need adjusting. If game operates OK at this point, connect the coin counter wire to: 1 to the white/red (+5V)

1 to the white/yellow (coin counter)
(If coin counter does not advance when coin switch is actuated, reverse the order of these two wires)

# MONITOR SECTION

- A. ELECTROHOME
- B. WELLS GARDNER

## **ELECTROHOME MONITOR ADJUSTMENTS:**

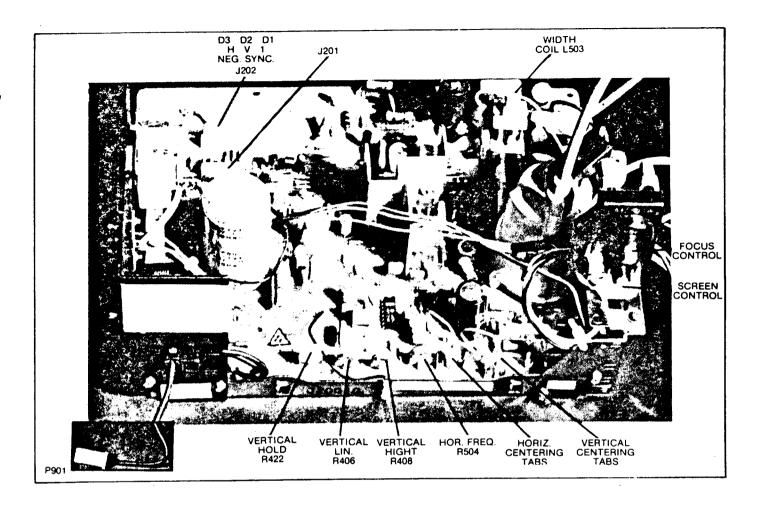
Two problems may surface after completing the electronic conversion. One, the picture may roll uncontrollably and two, the picture may be upside-down.

A. If picture rolls uncontrollably; First adjust the vertical hold and horizontal frequency. If this does not correct problem set these two controls to their center.

The game you are now installing outputs the following signals: Red Info, Green Info, Blue Info and Neg. Comp. Sync Info. It is the Negative Composite Syncronization Signal that is more likely to cause the picture rolling symptom.

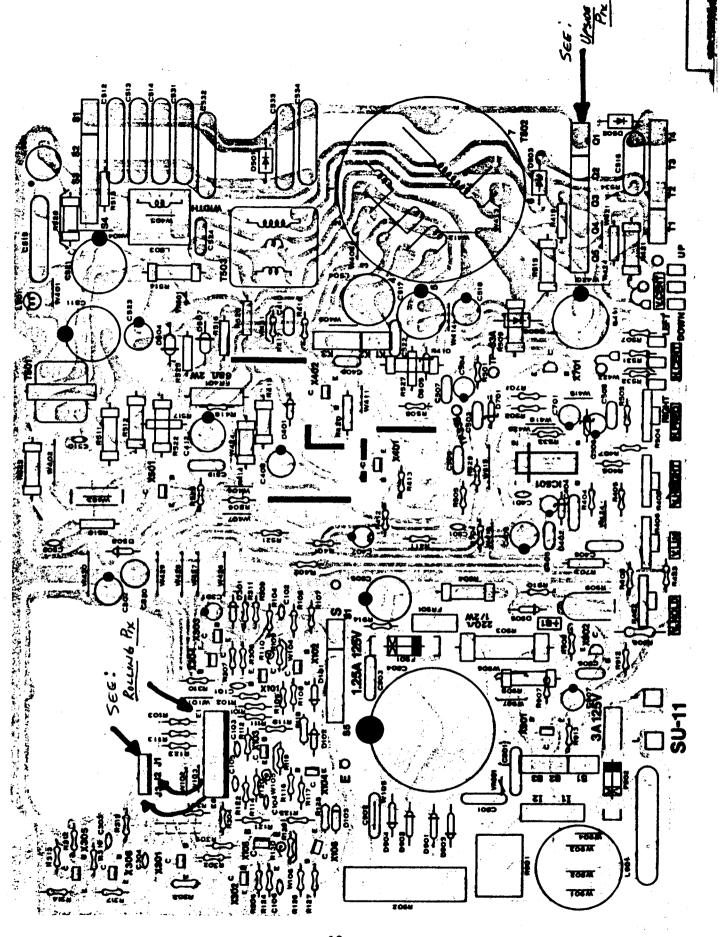
To correct this the sync input wire should be plugged into J2 & J3. (see main PCB component layout sheet.) It plugs into E5 & E6 for a positive sync signal.

B. If video picture is upside-down; Remove Q1 through Q5 connector on mother board (see main component layout sheet). Break each connector apart so that four wires with their plug remain. (notice each connector is labeled 1, 3, 4 and 5.) Plug Q3 connector onto Q5 on mother board, plug Q5 connector onto Q3 on mother board, plug Q1 connector onto Q4 on mother board, and plug Q4 connector onto Q1 on mother board. Discard Q2 plug.



# **Operating Instructions**

- 1. Apply a suitable power source to the monitor through an isolation transformer by means of P901.
- 2. Apply a suitable signal source to the monitor PCB by mean of J201.
- 3. For negative input pulses use J202 D21 for vertical T . D3 for Horizontal T .
- 4. Set up Controls
  All controls are preset at the factory, but may be adjusted to suit program material. Refer to pages
  6 and 8 (WHITE BALANCE AND GRAY SCALE TRACKING).



### WELLS GARDNER MONITOR ADJUSTMENTS:

Two problems may surface after completing the electronic conversion. One, the picture may roll uncontrollably and two, the picture may be upside-down.

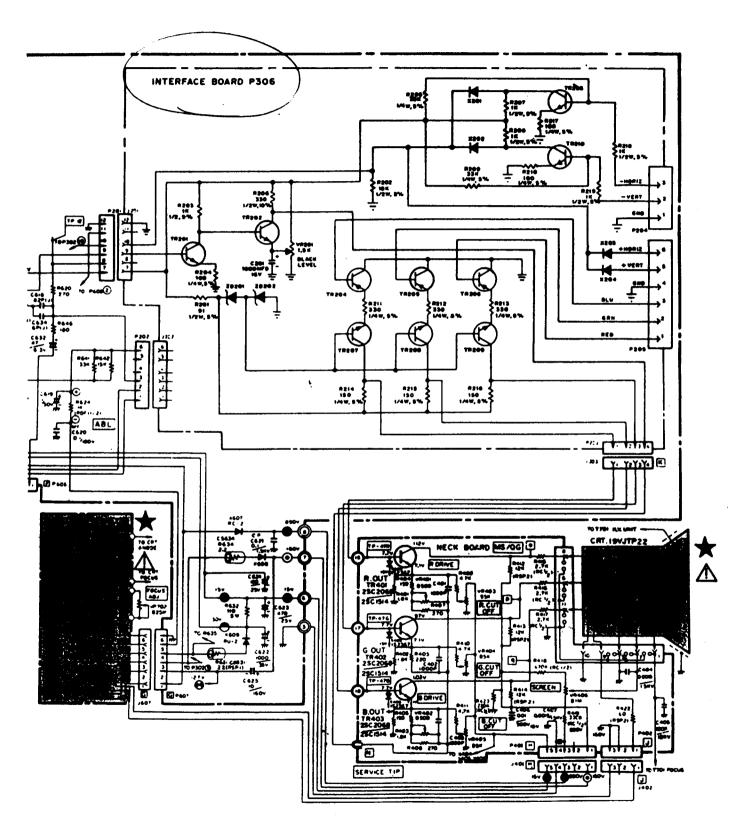
A. If picture rolls uncontrollably; First adjust the vertical hold and horizontal frequency. If this does not correct problem set these two controls to their center.

The game you are now installing outputs the following signals: Red Info, Green Info, Blue Info and Neg. Comp. Sync Info. It is the Negative Composite Syncronization Signal that is more likely to cause the picture rolling symptom.

Connect the sync wire to the -horizontal, -vertical or both. (It may be connected to the +horizontal, +vertical inputs.)

B. If video picture is upside-down;
To invert the picture locate the four wires on the deflection yoke (picture tube neck.) Switch the two outer wires, then switch the two inner wires.
(Switch yellow & green and blue & red) If these wires are soldered on, trace them down to a 4 plug connector. Break the connector in half. Turn both halves 180 degrees and plug back in. That's all there is to it.

# LOR MONITOR SCHEMATIC DIAGRAM MODEL 19 K4605 & 19 K4655



## UNIVERSAL HARNESS

ASSIGNED PIN #	C LOR CODE	FUNCTION	SIDE 2 PIN #
15 PIN CAP			12 PIN PLUG
1 2 3 4 5 6 7 8 9 10	BLK ORG WHT/YEL WHT/VIO WHT/BLU YEL BRN WHT/BRN WHT/BRN WHT/BLK WHT/BLK/BRN WHT/BLK/BRN	GROUND 1P START 2P START LEFT RIGHT UP DOWN FIRE BOMB FUNCTION 1 FUNCTION 2	1 2 3 4 5 6 7 8 9 10
			OPEN SPADES
12 13 14 15	(2)NHT/RED (2)NHT/GRN VIC (2)BLK	+5 VOLTS -5 VOLTS +12 VOLTS GROUND	+5, -5 & GND TO 9 PIN CAP
15 PIN PLUG			10 PIN INLINE
1 2 3 4 5	RED GRN BLU BLK	RED MON GRN MON BLIJ MON GROUND	1 2 3 4
6	WHT/GRY	COMP SYNC	9 PIN CAP
7 8 9 10	BLK BLK WHT/ORG	GROUND GROUND COIN SW	1 2 3
11 12 13	WHT/RED WHT/GRN WHT WHT/YEL	+5 to COIN CTR -5 to COIN LITES TEST SW COIN CTR	5 6 8
11 12	WHT/RED WHT/GRN WHT	+5 to COIN CTR -5 to COIN LITES TEST SW	5 ทั

## CALIPSO

PART SIDE				SOLDER SIDE	
FUNCTION	COLOR	PIN	PIN	COLOR	FUNCTION!
+12V AUDIO FIRE UP FIRE RT	VIOLET GRAY WHITE WHT/BLK	1 2 3 4 5	A B C D E	WHT/GRN GRAY WHT/BLK/BRN WHT/BRN	-5V AUDIO FIRE DOWN FIRE LT
TEST SW UP LEFT 1P START	WHT YEL WHT/VIO ORG	6 7 8 9 10	F H J K L	BRN WHT/BLU	DCWN RIGHT
COIN CTR	WHT/YEL	11 12	M N	WHT/YEL	2P START
MON BLUE MON SYNC	BLU WHT/GRY	13 14 15	P R S	GRN RED	MON GREEN MON RED
GND GND +5V	BLK BLK WHT/RED	16 17 18	T U V	BLK BLK	GND GND

## DIP SWITCH SETTING:

	ON			<u>OFF</u>
DIP 1 DIP 2 DIP 3	SOUND IN 5 LIVES NOT USED	DEMO		CM3D IN DEMOS
	DIP 4	DIP 5	COINS	CREDITS
COIN 1 INPUT	CFF OFF ON ON	OFF OFF ON	1 1 1	4 3 1 2
	DIP 4	DIP 5	COINS	CREDITS
COIN 2 INPUT	OFF OFF ON ON	CFF ON OFF CN	4 3 1 2	1 1 1 1

## ANTEATER

PART SIDE "B" SIDE ON I	PCE			PART SIDE "A" SIDE ON PCB	
FUN:CTION	COLOR	PIN	PIN	COLOR	FUNCTION
+12V AUDIO	VIOLET GRAY	1 2 3 4 5	A B C D E	WHT/GRN GRAY	-5V AUDIO-P10
RETRACT/TEST 1P UP 1P LEFT 1P START	WHT/BRN YELLOW WHT/VIC ORANGE	ნ 7 8 ფ	H J K	BROWN WHT/BLUE	1P DOWN 1P RIGHT
COIN CTR	WHT/YEL	10 11 12	<u>L</u> N:	WHT/ORG WHT/YEL	ON COIN CTR 2P START
MON BLUE MON SYNC	BLUE WHT/GRY	13 14 15	P R	GREEN RED	MON GREEN MON RED
GND GND +5V	BLK BLK WHT/RED	16 17 18	S T U V	BLK BLK WHITE	GND GND + FOR COIN CTR

# DIP SWITCH SETTING:

	ON		OFF		
DIP 1 DIP 2 DIP 3	SOUND IN DEMO 5 LIVES NOT USED		5 LIVES 3 LIVES		
	DIP 4	DIP 5	COINS	CREDITS	
COIN 1 INPUT	OFF OFF ON ON	OFF OFF ON	1 1 1	4 3 1 2	
	DIP 4	DIP 5	COINS	CREDITS	
COIN 2 INPUT	OFF OFF ON ON	OFF ON OFF ON	4 3 1 2	1 1 1	

# CONQUEST

FUNCTION	COLOR	B SIDE NIP	A SIDE PIN	COLOR	FUNCTION
+12 AUDIO	VIO GRY	1 2 3 4	A B C D	WHT/GRN GRY	-5V AUDIO
2P START TEST SW	WHT/YEL WHT	5 6 7	E F H	ORG WHT/BRN WHT/BLK	IP START FIRE FWD
LEFT	WHT/VIO	8 9 10	J K L	WHT/BLU WHT/ORG	RIGHT COIN SW
COIN CTR	WHT/YEL	11 12	M N		
MON BLUE MON SYNC	BLU WHT/GRY	13 14 15	P R S	GRN RED	GRN MON RED HON
GND GND	BLK BLK	16 17	T U	BLK BLK	GND GND

# DIP SWITCH SETTING:

SW	1_	TABLE/	<u>UP</u>					
	ON OFF	TABI UP	.E					
SW	2_	ROCKET	NUMBER					
	ON OFF		<b>4</b> <b>3</b>					
SW	3_	POSSIE	BLE ADDITIO	NAL GAME	NUMBER			
	ON OFF	FRE On C	E PLAY DE					
SW	4 5				Y NUMBE	R	11 6 A	
			1 way	ROPA 2 wa	<u>7</u>	1 way	U.S.A.	2 way
		ON OFF	1 c - 99 p	1 c -	$\overline{3} p / 2$			c - 1 p c - 2 p
	OFF 0	)N	1 c - 1 p 2 c - 1 p	1 c -	3 p 3	c - 1	p 1	c - 3 p
	OFF C	)FF	4 c - 1 p	1 c -	3 p 4	c - 1	p 1	c - 4 p
SW	<u>6</u>							
	ON OFF		U.S.A. EUROPA					

### GAME DIAGNOSTICS

Most failures that occur in the field are due to loose connections or defective switches. A diagnostic test has been included in the program to help test, and therefore correct, any problem related to CONTROL, COIN, CR ROM/RAM failures.

To enter the DIAGNOSTIC TEST press the TEST switch while turning game on. If your game has no test switch, ground pin B6 on the card edge connector while turning game on. MONITOR WILL DISPLAY THE FOLLOWING DATA:

*				1	PORT A			
<b>X</b>	Х	Х	X	Х	X	X	X	
* CS2	CS1	LF1	RT1	DN1	UP1	N/U	RETRACT 8	₹ TS
				1	PORT B			
X	X	X	X	X	X	X	X	
* N/U	N/U	LF2	RT2	DN2	UP2	DS1,	DS2	
				1	PORT C			
X	Х	Х	X	X	X	X	X	
* N/U	2PS	N/U	N/U	DS3	DS4	DS5	1PS	

<sup>\*</sup>Lines preceded by \* are not displayed. This data corresponds to switch being act ated. 1= off condition, 0= on condition.

### MENOMICS LISTING

 $CS = coin \ switch$  LF = left RT = right DN = down  $TS = test \ switch$   $DS = dip \ sw \ on \ PCB$ 

IF THERE IS A ROM/RAM FAILURE MONITOR WILL DISPLAY:

ROM XX XX denotes location of defective chip

RAM GHJK denoting 2114 RAM failure (replace 1 chip at a time)